

Notice of Allowability

Application No.

10/057,842

Examiner

Dhairya A. Patel

Applicant(s)

KAZEMI ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/17/06.
2. ☒ The allowed claim(s) is/are 1-5, 7-15.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


ZARNI MAUNG

SUPERVISORY PATENT EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Michael C. Martensen (Reg. # 46,901) on 3/10/2006.
3. The application has been amended as follows:

In the Claims

Please **AMEND** claims 1,12,14 and 15 in accordance with the following:

- 1). (currently Amended) A data storage system that provides dynamic remapping of resources, the data storage system comprising:

a first network attached data storage device for storing one or more data storage resources connected to a raid controller;

a storage area network hub coupled to the raid controller and in communication with the first network attached data storage device;

at least one client device configured to request data from the first network attached data storage device;

a first server in communication with the first network attached data storage device;

a second server in communication with the first network attached data storage device, wherein the first and second servers communicate with the first network attached storage device via a local network; and

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a dynamic session redirector circuitry in communication with at least one client device via a stateful protocol and in communication with both the first server and the second server, wherein the dynamic session director circuitry is configured to access the first network attached data storage device in response to the request from the at least one client device, the dynamic session redirector circuitry is configured to access the first network attached data storage device through either the first server or the second server, the dynamic session redirector determining which server through which to access the first data storage device based upon the operational status of the first and second servers, wherein the dynamic session redirector circuitry maintains a table listing an association between the first network attached data storage device and the first and the second server through which the dynamic session redirector circuitry accesses the first network attached data storage device, and wherein the dynamic session redirector rewrites the table when the first network attached data storage device through a different server.

12). (Currently Amended) A method for accessing data on a plurality of network attached data storage devices comprising:

receiving a request for access to one of the plurality of network attached data storage devices wherein the plurality of network attached data devices are connected to a raid controller;

looking up an association between the one of the network attached data storage devices and one of a plurality of servers for accessing the plurality of storage devices, wherein the plurality of servers communicate with the plurality

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of network attached data storage devices via a storage area network hub that is coupled with the raid controller;

accessing the one of the network attached data storage devices through the one of the plurality of servers;

determining the load on at least one of the plurality of servers; and

assigning new associations between the plurality of network attached data storage devices and the plurality of servers based upon the load on at least one of the plurality of servers as determined by a dynamic session redirector in communication with at least one client device via a stateful protocol and in communication with the plurality of servers, wherein the dynamic session redirector sends requests for access to at least one of the plurality of network attached data storage devices in response to a request for access to data made to the dynamic session redirector by the plurality of servers, and wherein the dynamic session redirector further comprises a table mapping at least one of the plurality of network attached data storage devices with at least one of the plurality of servers, and the dynamic session redirector sends the request for access to the network attached data storage devices to one of the plurality of servers based upon the mapping between the network attached data storage device being accessed and the at least one server listed in the table, and wherein the dynamic session redirector may remap any of the plurality of network attached data storage devices with one of the plurality of servers based upon the status of the plurality of servers.

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14). (Currently Amended) A method for accessing data on a plurality of network attached data storage devices comprising:

receiving a request for access to one of the plurality of network attached data storage devices wherein the plurality of network attached data devices are connected to a raid controller;

looking up an association between the one of the network attached data storage devices and a plurality of servers for accessing the plurality of network attached data storage devices wherein the plurality of servers communicate with the plurality of network attached data storage devices via a storage area network hub and one or more raid controllers;

sending a first request to a first of the plurality of servers for accessing the one of the network attached data storage devices;

sending a second request to a second of the plurality of servers for accessing the one of the network attached data storage devices;

receiving a first response from the first server;

receiving a second response from the second server;

determining the load on at least one of the plurality of servers; and

assigning new associations between the plurality of network attached data storage devices and the plurality of servers based upon the load on at least one of the servers as determined by a dynamic session redirector in communication with at least one client device via a stateful protocol and in communication with the plurality of servers, wherein the dynamic session redirector sends requests for access to at least one of the plurality of network

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attached data storage devices in response to a request for access to data made to the dynamic session redirector by the plurality of servers, and wherein the dynamic session redirector further comprises a table mapping at least one of the plurality of network attached data storage devices with at least one of the plurality of servers, and the dynamic session redirector sends the request for access to the network attached data storage devices to one of the plurality of servers based upon the mapping between the network attached data storage device being accessed and the at least one server listed in the table, and wherein the dynamic session redirector may remap any of the plurality of network attached data storage devices with one of the plurality of servers based upon the status of the plurality of servers.

15). (Currently Amended) A method for balancing the load among a plurality of servers being used to access a plurality of network attached data storage devices, the method comprising:

maintaining a table of associations between a plurality of network attached data storage devices and a plurality of servers where at least one of the plurality of network attached data storage devices is assigned to one of the plurality of servers and wherein the plurality of servers communicate with the plurality of network attached data storage devices via a storage area network hub and one or more raid controllers;

evaluating the load imposed upon the plurality of servers by the network attached data storage devices associated with the plurality of servers;

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determining whether the load imposed by the plurality of network attached data storage devices may be more evenly distributed among the plurality of servers by altering the associations between the plurality of network attached data storage devices and the plurality of servers; and

updating the table of associations between the plurality of network attached data storage devices and the plurality of servers to reflect the more even distribution of load as determined by a dynamic session redirector in communication with at least one client device via a stateful protocol and in communication with the plurality of servers, wherein the dynamic session redirector sends requests for access to at least one of the plurality of network attached data storage devices in response to a request for access to data made to the dynamic session redirector by the plurality of servers, and wherein the dynamic session redirector further comprises a table mapping at least one of the plurality of network attached data storage devices with at least one of the plurality of servers, and the dynamic session redirector sends the request for access to the network attached data storage devices to one of the plurality of servers based upon the mapping between the network attached data storage device being accessed and the at least one server listed in the table, and wherein the dynamic session redirector may remap any of the plurality of network attached data storage devices with one of the plurality of servers based upon the status of the plurality of servers.

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Allowable Subject Matter

4. Claims 1,2,3,4,5,7,8,9,10,11,12,13,14,15 respectively are allowed which are renumbered as 1,2,3,4,5,6,7,8,9,10,11,12,13,14 respectively. Original claim 6 is cancelled.

5. This communication warrants no examiner's reason for allowance, as applicant's reply makes evident the reason for allowance, satisfying the record as whole as required by rule 37 CFR 1.104 (e). In this case, the substance of applicant's remarks filed on February 17, 2006 with respect to the amended claim limitations point out the reason claims are patentable over the prior art of record. Thus, the reason for allowance is in all probability evident from the record and no statement for examiner's reason for allowance is necessary (see MPEP 13202.14).

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dhairya A. Patel whose telephone number is 571-272-5809. The examiner can normally be reached on 8:00-5:30.

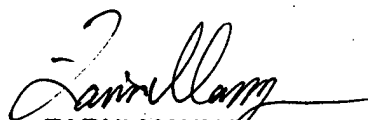
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zarni Maung can be reached on 571-272-3939. The fax

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phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAP



ZARNI MAUNG

SENIOR PATENT EXAMINER